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| Ovary inferior. | } | Some Gamopetalæ and Polypetalæ, such as Compositæ Umbelliferæ, Rubiaceæ, Onagraceæ, etc. |
| Ovary superior. | | Some Gamopetalæ and Polypetalæ, such as Leguminosæ, Scrophulariaceæ, Labiata, etc., and Apetalæ. |

It must be distinctly understood that the above does not present a proposed classification, but simply traces some of the probable results of organogenic study.

It is of no small consequence in these days to obtain the testimony of paleontology in favor of any system of classification. The order of appearance of Phanerogams is well known; first, Gymnosperms, then Monocotyledons, long afterward Dicotyledons, and the last Dicotyledons were those with inferior ovaries. From such great composite groups as Compositæ, therefore, the flora of the future is to be worked out.

GENERAL NOTES.

Results of the Ann Arbor Meeting.—This meeting gave more than the usual opportunities for becoming acquainted and benefited by the society of the members during the intervals between the regular sessions, owing to the short radius within which the members found entertainment, and the fewer distractions than in the case of large meetings, with their multiplicity of excursions and receptions. This advantage was made good use of by most, and it is safe to say that, so far as the botanists are concerned, no former meeting has yielded such full and satisfactory returns in this regard.

The attendance of botanists was unexpectedly large, and gives assurance of the continued prosperity of the club.

The efforts of the club from the beginning have been directed toward raising the standard of the botanical papers presented to the Association, and it is gratifying to note that this is actually being accomplished. It is certain that as a whole the botanical papers of this year will compare more favorably with those presented in other departments of biology than at any previous time. This is both because the papers are actually better than usual, and because the less weighty ones have been sifted out. These siftings found appropriate presentation before the club, where they met a sympathetic audience ready to turn to good use every morsel of value they contained. The total result is that the Association gets better botanical papers, and the botanists get through the club more items, notes and news than heretofore.

The committee of the Association on the encouragement of researches on the health and diseases of plants reported that the first and very important object in view had been accomplished. This was the recognition from the Commissioner of Agriculture of the need of work of this kind and some provision for its prosecution at Washington. Commissioner Colman, upon receiving the

first memorial of the committee, at once appointed Mr. Scribner, of Girard College, well known as an accurate botanist, to devote his whole time to this kind of work. The committee then sent Mr. Scribner the assurance of their cooperation in developing this new feature of the Department. Commissioner Colman has since shown in many ways his belief in the value of the work proposed by the committee, and his determination to prosecute it as fully as circumstances will permit. The committee, which consisted of seven members, was found to be unwieldy, and the desirability of having at least one member a resident of Washington was urged. For these reasons it was reorganized, and the following members selected for the coming year: J. C. Arthur, of Geneva, N. Y.; C. E. Bessey, of Lincoln, Neb.; W. G. Farlow, of Cambridge, Mass.; T. J. Burrill, of Champaign, Ill.; and C. V. Riley, of Washington, D. C.

The Botanical Club adopted a resolution supporting Commissioner Colman in this work, and offering to exert their influence with their respective Congressmen to secure a suitable appropriation.

The committee of the Association on postage for botanical specimens reported that the matter had been suitably presented to the Postmaster-General, who made the desired recommendation to Congress, which may be found on page 15 of his Annual Report for 1883-4, but that owing to the rush of business at the close of the session it was neglected. They think there will be no difficulty, however, in securing its passage at the coming session, thus permitting herbarium specimens, accompanied with the usual label, whether written or printed, to go at fourth class rates of postage. The committee, consisting of L. F. Ward, Geo. Vasey, and J. W. Chickering, was continued.

The action of the club in regard to the relationship of the botanists of the country to the national herbarium is given elsewhere in the account of proceedings of the club.

The discussion of the highly important subject of a uniform nomenclature of English names of plant diseases and of disease producing fungi has also been given in the proceedings of the club. The committee to investigate the subject is composed of J. C. Arthur, W. G. Farlow and W. Trelease.

Plants of the Greely Expedition.¹—List of plants collected in the summer of 1882 and 1883, by Lieut. A. W. Greely and members of the L. F. B. Expedition, in the vicinity of Fort Conger, Grinnell Land, situated in lat. 81° 44' N., long. 64° 45' W.:

1. *Ranunculus nivalis* R. Br. var. *sulphureus* Wahl. From the sea level to 1,800 ft. 5 to 7 in. high.
2. *R. affinis* R. Br. 1,800 ft. alt. 5 in. high.
3. *Papaver nudicaule* Linn. Sometimes nearly white flowered.
4. *Cochlearia officinalis* Linn.? 1 to 3 in. high.
5. *Braya alpina* Sternb. var. *glabella*. (*B. purpurascens* R. Br.)
6. *Vesicaria arctica* Rich. Sea coast to 1,000 ft. alt. The largest specimen 4 in. high and spreading 6 to 7 in. wide.
7. *Parrya arenicola* Hook. f.?
8. *Eutrema Edwardsii* R. Br.

¹ Read in part before the Botanical Club of the A. A. A. S., at the Ann Arbor meeting, August, 1885.

9. *Cheiranthus pygmæus* Adams. (*Hesperis pygmæus* Hook.) From 50 to 1,000 alt. The specimens are young and mostly less than 2 in. high, the largest 6 in. A few found with stem and pods of two preceding years' growth.
10. *Draba hirta* Linn. (*D. arctica* Vahl.) 2 to 3 in. high.
11. *D. rupestris* R. Br.
12. *D. alpina* Linn. In flower June 16.
13. *Lychnis apetala* Linn. From the coast to 1,000 ft. alt. The specimens from 1 to 5 in. high, rarely 2 or 3 flowered.
14. *Lychnis triflora* R. Br. With the preceding, the stem and leaves more pubescent, mostly 1 flowered, rarely 2 or 3 flowered.
15. *Arenaria Groenlandica* Spring.? In leaf only.
16. *A. verna* Linn. var. *hirta*. 200 to 1,000 ft. alt.
17. *Cerastium alpinum* Linn. (*C. lanatum* Lam.)
18. *Stellaria longipes* Goldie, var. *Edwardsii* T. & G. From the sea to 1,000 ft. alt. 2 to 4 in. high.
19. *Potentilla nivea* Linn. Coast to 1,000 ft. alt. 2 to 5 in. high.
20. *P. nivea*, var. *quinata* Lange.
21. *P. pulchella* R. Br.
22. *P. maculata* Pourr.
23. *Dryas octopetala* Linn. var. *integrifolia*. Coast to 1,000 ft. alt. The specimens are 1 to 2 in. high, leaves mostly entire, sometimes minutely toothed. The most common plant found, beds of acres in extent being frequent, especially in the interior. Often with many petals.
24. *Saxifraga oppositifolia* Linn. Coast to 1,900 ft. alt. Flowers from 4 to 9 petaled, varying from pink to dark purple.
25. *S. flagellaris* Willd. 1,200 to 1,800 ft. alt., generally 1 flowered.
26. *S. tricuspidata* Retz. Not found below 800 ft. alt. 2 to 4 in. high.
27. *S. cæspitosa* Linn.
28. *S. nivalis* Linn. Found between 800 and 1,200 ft. alt. Specimens mostly 2 to 3 in. high, some found as high as 6 in.
29. *S. cernua* Linn. From 200 to 1,800 ft. alt. 3 to 8 in. tall.
30. *S. rivularis* Linn. var. *hyperborea* Hook.
31. *Epilobium latifolium* Linn. Coast to 1,200 ft. alt. Found only on rocky soil. Specimens from 2 to 4 in. high.
32. *Erigeron uniflorus* Linn. Coast to 800 ft. alt., becoming larger at the higher altitudes. Specimens 2 to 5 in. high.
33. *E. compositus* Pursh, var. *trifidus* Gr. From 100 to 800 ft. alt. Specimens from 1½ to 3 in. high, generally 1 flowered.
34. *Arnica alpina* Olin. Coast to 1,500 ft. alt. 2 to 6 in. high.
35. *Taraxacum officinale* Web. var. *lividum* Koch. Coast to 200 ft. alt. 2 to 4 in. high, two shades of color, deep yellow and yellowish-white.
36. *Cassiope tetragona* Linn. From 100 to 500 ft. alt.
37. *Androsace septentrionalis* Linn. 50 to 500 ft. alt.
38. *Pedicularis capitata* Adams. From 100 to 700 ft. alt.
39. *P. Langsdorffii* Fisch. var. *lanata* Gr. From 50 to 100 ft. above the sea, in company with *Dryas*.
40. *Oxyria digyna* Camp. Specimens from 5 to 7 in. high.
41. *Polygonum viviparum* Linn. From 100 to 800 ft. alt.
42. *Salix arctica* Pall. Coast to 1,800 ft. alt. From 1 to 1½ ft. in length.
43. *Luzula hyperborea* R. Br. (*L. confusa* Lindb.)
44. *Juncus biglumis* Linn. Margin of small ponds. 3 to 6 in. high.
45. *Eriophorum angustifolium* R. Br. 800 to 1,200 ft. 3 to 8 in. high.
46. *Kobresia scirpina* Willd.
47. *Carex nardina* Fries.

48. *C. rupestris* All.
49. *C. ustulata* Wahl. var. *minor* Boott.
50. *C. vulgaris* Fr. var. *hyperborea* Boott.
51. *Alopecurus alpinus* Linn. Specimens from 4 to 18 in. high.
52. *Arctagrostis latifolia* Gris. Coast to 800 ft. alt. From 5 to 6 in. high.
53. *Deschampsia brevifolia* R. Br. (*Aira arctica* Spr.) Specimens from 2 to 4 in. high. Not the *Aira arctica* of Rothrock's Flora of Alaska, nor *Aira cæspitosa*, var. *arctica* of authors.
54. *Trisetum subspicatum* Beauv. Coast to 800 ft. alt. From 3 to 7 in. high.
55. *Poa cerisia* All. (*P. arctica* R. Br.) From 2 to 5 in. high.
56. *P. abbreviata* R. Br.?
57. *P. alpina* Linn. var. *vivipara*.
58. *P. laxa* Haenke. Specimens 3 to 8 in. high.
59. *P. cæsia* Smith, var.
60. *Festuca rubra* Linn. var. From 3 to 5 in. high.
61. *Agropyrum violaceum* Hornm. From 2 to 7 in. high.
62. *Equisetum variegatum* Schl.
63. *E. arvense* Linn.
64. *Cystopteris fragilis* Bernh. Coast to 1,300 ft. From 3 to 6 in. high.

"PUCCINIA CHEIRANTHI, Ellis & Everhart (n. sp.) On *Cheiranthus pygmaeus*, Grinnell Land.

"III. Sori hemispheric, brown, naked, $\frac{1}{2}$ to $\frac{3}{4}$ mm. in diam., thickly scattered over both sides of the leaves, but (in the specimen examined) not confluent. Spores oblong or clavate-oblong, light brown, constricted at the septum, $35-53 \times 15-22\mu$, either consisting of two subequal cells or oftener the upper cell broader and shorter (subglobose) and the lower one tapering into the stout, rather persistent pedicel, which is about as long as or a little longer than the spore itself; epispore smooth or faintly but rather coarsely roughened above, thickened and lacerated at the apex so as to resemble somewhat the remains of the calyx on a currant or huckleberry.

"I. and II. not seen. This appears to be sufficiently distinct from the other species on the *Cruciferae*."

I am indebted to Prof. Watson and Dr. Gray for the determination of some of the species included in the list.—GEO. VASEY.

Botanical Features of New Brunswick.¹—There are two striking physical features of the Province which affect its flora in a marked degree. Its southern shore is a wall of rock, veiled in cold mists of fogs from the Bay of Fundy. Interspersed here and there between these fog-bound hills are peat bogs and evergreen forests, whose flora is of the most boreal type. The average summer temperature is not more than 58°. In the summer of 1884 I had an opportunity to compare the flora of the hills about St. Johns, in lat. 45°, with an inland mountain peak in the northern part of the Province, in lat. 47°, with an altitude of 2,240 feet. The flora in each case was strikingly alike, with an advantage perhaps in favor of the top of the inland peak. Along the outer face of these cliffs that border on the Bay of Fundy, and filling the clefts of the rocks, are reddish colored tufts of *Sedum Rhodiola*. Chief among the plants of

¹ Read before the Botanical Club of A. A. A. S., at the Ann Arbor meeting, August, 1885.

the peat bogs is the Cloud Berry (*Rubus Chamemorus*), while the ground is covered in many places with *Empetrum nigrum* and *Vaccinium Vitis-Idæa*; and *Potentilla tridentata* with its bright blossoms makes cheerful many a dull rocky crag. These, with many other boreal types, find a genial home in the low temperature and fog-laden atmosphere of the extreme south of New Brunswick, while hidden away still deeper in the clefts of the limestone rocks and generally on the northern sides, is the pretty little *Asplenium viride*, but with no trace as yet in this Province of its congener, *A. trichomanes*.

But the second physical feature is the great valley of the St. John river and its tributaries, whose flora is far more southerly in character than that above enumerated, although in its northern portions it has many striking boreal forms. In the rich alluvial bottoms of the St. John and its tributaries I have seen *Struthiopteris Germanica* six and seven feet high. Along the Tobique river I saw *Osmunda regalis* growing to the height and profusion to which alders grow on the borders of other streams. I have before me a tuft of *Elymus Canadensis* nine feet in height, collected at Eel river, one hundred miles from the mouth of the St. John. In the rich intervals there are *Sanguinaria Canadensis*, *Asarum Canadensis*, *Caulophyllum thalictroides*, *Adiantum pedatum*, and others whose growth would be impossible were it not that the cold fogs of southern New Brunswick have been dissipated by the sunshine which reigns here day after day, and that the rocky coasts have given place to alluvial meadow and green field. One other feature of this St. John river valley may be referred to. Rising from the famous Aroostook region of Maine, it bears upon its waters the seeds of many plants, which are peculiar to this river so far as American botany is concerned. Among these may be mentioned *Oxytropis campestris*, *Astragalus alpinus*, *Hedysarum boreale*, *Tanacetum Huronense* and others.—GEO. U. HAYS.

Society for the Promotion of Agricultural Science.—The sixth meeting of this society was held at Ann Arbor the day preceding the meeting of the A. A. A. S., and was unusually good, both in point of attendance and character of the papers presented. The first paper was read by Mr. J. J. Thomas, of New York, upon the influence of locality upon the varieties of fruit. The writer opposed the very prevalent view that fruit raised in our own country is on that account better suited to our cultivation. In the discussion Dr. Sturtevant called attention to the fact that any fruits are most highly flavored in their most northern localities, and larger and finer looking toward the south. He suggested the influence of actinism as a possible explanation. The two following papers were by Dr. E. L. Sturtevant, of New York, upon the dandelion and lettuce. It was an attempt to prove that the forms of cultivated plants are selected wild types rather than forms originated by culture. Prof. C. E. Bessey, of Nebraska, read a paper upon the demands made by agriculture upon the science of botany. The demands are as follows, and any of our professional botanists who may be seeking new fields of work, can give them some serious thought:

1. A nomenclature and classification of the plants of the farm, cultivated as well as wild.
2. A better knowledge of the physiology of plants, including such sub-

jects as growth and nutrition, fertilization, heredity, and the physiology of cultivation and improvement.

3. A better knowledge of the pathology of plants, particularly of that ill-defined state known as "lowered vitality."

By all of which is meant not only that botanists should learn more concerning the subjects mentioned, but also that students should be better taught the little we do know about them.

Prof. T. J. Burrill's paper upon an experiment in silk culture was chiefly concerned with a contagious disease which destroyed the worms. This he identified as the *flacherie* of Pasteur, probably the first recognized existence of this disease in America. The other papers were not botanical, except a short report by Prof. W. J. Beal, upon the progress of certain experiments upon the vitality of buried seeds. The officers elected for next year are Henry E. Alvord, president, and B. D. Halsted, secretary and treasurer.

Some Nasturtium Leaves.—One day last month, when plucking a bunch of garden Nasturtiums (*Tropaeolum*) I observed two small abnormally shaped leaves on one lateral stem. They were spatulate in form, and each was about $1\frac{5}{8}$ inches in length, the blade of one an inch long, and its petiole five-eighths of an inch; while the other had the stem relatively a little longer. A third leaf, only three-fourths of an inch in diameter, was normally peltate. The branch was in flower.

On an other occasion I found another Nasturtium leaf (one and one-half in. diam.) that was round reniform, with the margin of the leaf at its base not brought together and united, the petiole being attached to the blade at its base, instead of being attached on the under surface of the leaf, as with this plant usually. This form might, I should think, illustrate the evolution of the peltate leaf from a rounded leaf by the joining together of the lower margin. The spatulate leaves would, however, require more modification, the blade of the leaf needing to be much widened and extended at its base into lobes before the margins could coalesce into the shield-shaped form.—ROSA SMITH, *San Diego, Cal.*

Notes on Black Knot.—These notes of occasional observations on *Plowrightia* (*Sphaeria*) *morbosa* this season may be worth saving, as they differ in some particulars from what has been recorded.

The first examination was January 6, when the asci were found considerably developed and spores beginning to form. By the first of March most of the asci contained spores, but they were still unripe. Development continued slowly until warm weather, then more rapidly until the middle of May, when spores were the most numerous. Most of the spores now had thicker, dark-colored walls, were apparently ripe, and some were being discharged. Ascospores continued to be formed in perithecia which were in depressions of the knot, until June 17, when the new knots were well advanced and bearing conidia.

The mycelium stimulates to excessive development the growth of the year, which, bursting the older bark, permits the fruit of the parasite to form at the surface of the living tissue thus exposed. With the excessive development the

tissues lose their character somewhat, but when the knots are young the distinction between bark and wood still exists, the cambium line being deflected outward through the knot.

Knots on the wild plum in this vicinity contain no live perithecia so far as seen, and the same is often the case with the cultivated plum. In a few instances the knot was found on *Prunus serotina*. It has not yet made its appearance in the orchards in the northern part of the state.—A. A. CROZIER, *Ann Arbor, Mich.*

The *Æcidium* of *Adoxa*.—The *Adoxa Moschatellina* L. grows abundantly in some localities in northern Iowa, where it is much infested with the *Æcidium albescens* Grev. According to European botanists this fungus is a state of *Puccinia Adoxæ* DC. Teleutospores have not, however, been found in America, and it is not easy to account for the abundant *æcidium* without them. It has been suggested that the *æcidium* might be perennial in the subterranean stems of *Adoxa*. To test this some plants were forwarded in the spring of 1884, through the kindness of Mr. E. W. Holway, to Geneva, N. Y., which were thoroughly covered with cluster cups. They were potted and placed in the green-house, and up to the time the leaves normally disappeared continued to bear the *æcidium*. When cold weather approached the pot was sunken out of doors, where it remained until the following March. It was then placed in the green-house and the plants at once started into vigorous growth. Perfectly healthy and rich foliage succeeded, and in due time numerous rhizomes were pushed out beneath the soil, but up to the present month no *æcidium* whatever has appeared. This seems to prove quite conclusively that *Æcidium albescens* is an annual. The plants were removed a thousand miles from their nearest locality and grown normally, except that they were induced to start some weeks before the usual time in the spring, and no cluster cups appeared. How the *æcidium* tides over the long interval from one season's activity to another is as great a problem as ever.—J. C. A.

Notes on Florida Lichens.—During my annual winter sojourn in Florida I was somewhat at a loss as to what sort of plants should receive attention. I had time and again collected most of the flowering species to be found from December to March. Arriving in Jacksonville about Christmas and having put my house in order, I was ready for active work. I could not neglect my old friends, the Phanerogamia, and numerous excursions resulted in my collecting nearly one hundred species, all old acquaintances, but several, as *Verbesina heterophylla*, *Polygala grandiflora*, and *Bigelovia nudata* were a novel sight even here in midwinter. *Heterotheca Lamarckii* was very common in old fields. Several species of *Chrysopsis* were also abundant. The foregoing were evidently late bloomers of the fall. During my daily rambles through the pine barrens and the hardwood hummocks I had been looking around for some new field of investigation and this seemed to be offered me in the extraordinary abundance of Fungi and Lichens. To use a common expression, "the woods were full of them," and I was reminded of my mushroom-eating friends at home whom I had seen wandering around barn yards and fields in early morn and to whom,

possibly, I stand indebted for giving me hints on this subject. I began collecting, and the results show one hundred and sixty species obtained within a few weeks, and all collected at no greater distance than two miles from my home. For names I am under obligations to Mr. Ellis and Mr. Willey, both well known specialists. Of the species collected four are supposed to be new. The Lichen flora I found everywhere in the greatest abundance—living trees being the favorite resort of the smaller and less conspicuous species. It has been supposed that the Lichens flourish best in a cool, dry climate. Florida is perhaps an exception. I collected about eighty species and am confident that as many more can be found within the state. The field is an inviting one for lichenologists. As I am only an amateur I can not do as much as I might in different circumstances. One of the first forms to attract attention is *Usnea barbata*. This clings in profuse masses from the trunks of *Taxodium* in swamps. The *Cladonias* affect the earth and old logs, always in damp situations. On the leaves of *Osmanthus Americana* and *Magnolia grandiflora* the *Strigula complanata* is common. Not a few species are West Indian and tropical. The accompanying list shows partially what can be done by a little effort in a very short time. Thus far I have found none of the species except *Cladonias* restricted to any particular habitat, as to trees. The oaks being most plentiful sustain the greater number. —W. W. CALKINS.

[The writer appends a list of 76 species and varieties collected by him, for which we can not take space. This list will doubtless be furnished gladly to those interested in the geographical distribution of lichens.—EDS.]

Second Blooming of Catalpa.—On one of the streets of Mt. Carmel, Ill., stand two large trees of our local native Catalpa (*C. speciosa*, Warder). During the first week in June they were both in full bloom. These flowers all dropped during the first half of that month. To-day, July 20, one of them is again in full bloom. The whole top is literally covered with flowers, and at the same time the beans of last month's flowers are hanging thick. In this second crop the panicles are about as large and full as in the first. The flowers are of the usual size, but a little paler. It is so unusual for a second flowering to be apparently as abundant as the first, that I think it proper to report this instance. Another peculiarity is the short time between the two crops—about six weeks.

—J. SCHNECK, *Mt. Carmel, Ill.*

Ferns of Petoskey.—Within four miles of this popular Michigan summer resort may be found the following: *Pteris aquilina*, in open ground; *Botrychium Virginicum*, widely distributed; *Cystopteris bulbifera*, on springy hill-sides; *Asplenium angustifolium* and *Filix-fœmina*, not common; *Osmunda Claytoniana*, in a single locality; *Phegopteris Dryopteris*, rather common; *Aspidium spinulosum*, variable and fine, wooded hills everywhere; *A. Thelypteris*, marshes; *A. cristatum*, and *Goldianum*, scarce; *A. marginale*, fine, and rather common; *Adiantum pedatum*, dry knolls in woods, abundant and fine.

—A. A. CROZIER.